

WHAT IS CLAIMED IS:

1. A method of reducing wafer slipping in a lithography system having a wafer chuck, comprising:
 - a. attaching a wafer to the wafer chuck to create an interface between the wafer and the wafer chuck;
 - b. expanding the wafer chuck to create an initial stress on the interface;
 - c. aligning the wafer and chuck to a wafer stage; and
 - d. exposing the wafer to a radiation source.
2. The method of claim 1, wherein said initial stress is sufficient to prevent slipping of the wafer during said exposing step.
3. The method of claim 2, wherein said expanding step comprises pressurizing an annular ring attached to the wafer chuck.
4. The method of claim 2, wherein said expanding step comprises actuating a force on the wafer chuck in a direction outward from the wafer chuck.
5. The method of claim 2, wherein said expanding step comprises heating the wafer chuck.
6. The method of claim 2, wherein said expanding step expands the wafer chuck uniformly in all directions.
7. A method of performing lithography in a vacuum, said method comprising:
 - a. attaching a wafer to a wafer chuck, to create an interface between the wafer and wafer chuck;

- b. aligning the wafer to the wafer chuck;
 - c. expanding said wafer chuck to create an initial stress on the interface between the wafer and the wafer chuck; and
 - d. exposing said wafer to a radiation source, wherein said initial stress on the interface between said wafer and said wafer chuck prevents slipping of said wafer during said exposing step.
8. The method of claim 7, wherein said expanding step comprises heating said wafer chuck.
9. The method of claim 7, wherein said expanding step comprises exerting a force on the edges of said wafer chuck, wherein said force is outward relative to said wafer chuck.
10. The method of claim 7, wherein said exposing step causes said wafer to expand.
11. A method of reducing overlay in a lithography system having a wafer chuck, comprising:
- a. heating a wafer, to cause the wafer to expand in size;
 - b. attaching the wafer to the wafer chuck;
 - c. allowing the wafer to cool, thereby contracting in size and creating an initial stress between the wafer and the wafer chuck.
12. A lithography system configured to reduce wafer slipping, comprising:
- a. a wafer chuck configured to receive a wafer; and
 - b. an expander coupled to the wafer chuck to expand the wafer chuck and create an initial stress at an interface between the wafer and the wafer chuck.

13. The system of claim 12, wherein said expander comprises:
an annular ring coupled to said wafer chuck.
14. The system of claim 13, wherein said annular ring is coupled to an
outer edge of said wafer chuck.
15. The system of claim 13, wherein said annular ring fits within a cavity
in said wafer chuck.
16. The system of claim 12, wherein said expander comprises:
a plurality of force actuators attached to said wafer chuck,
wherein said plurality of force actuators is configured to stretch
said wafer chuck.
17. The system of claim 16, wherein said plurality of force actuators is
dispersed evenly around said wafer chuck.
18. The system of claim 12, wherein said expander comprises:
a heater configured to heat said wafer chuck.
19. The system of claim 18, wherein said heater is a contact heater
disposed in contact with said wafer chuck.
20. The system of claim 18, wherein said heater is a proximity heater
spaced apart from said wafer chuck.
21. The system of claim 18, wherein said heater comprises an electrical
current source coupled to said wafer chuck to pass an electric current
through said wafer chuck.

22. The system of claim 18, wherein said heater heats said wafer chuck with electromagnetic radiation.
23. The system of claim 12, wherein said expander is configured to expand said wafer chuck in a uniform manner.